Role of Project Management Consultant to coordinate between clients and contractor

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Project Management Consultant (PMC) has become an important entity in the construction industry and the use of its services has increased significantly in recent years. The construction industry is often known as a very highly fragmented industry with a large number of activities involving different parties and professionals such as architects, engineers, quantity surveyors, contractor’s teams, suppliers, financiers and others. By being a fragmented industry, management efficiency and competency in the industry is needed to gain a higher level of competitiveness. The needs for such an approach has become more important and more pronounced, not only due to the increased size and complexity of building projects but also as a result of growing participation by international contractors.

One of the management solutions that have been widely used to improve efficiency of a project is through the use of Project Management Consultant services.

This study is carried out to investigate the services provided by Project management Consultant (PMC) in the construction industry. The study carried out or achieved by site visit to numbers of construction firms where PMC services are implemented and analysis of questionnaire survey. A framework of PMC Services that suits the construction environment was developed from the combination of four Project Management Consultant’s Contract based on the case studies carried out.

The analysis and results from 56 questionnaires (out of 150), indicates that there are 16 PMC services and most of the services listed by the author were regarded by the respondents as “important” services where as some of the services are “very important” and should be carried out by the Project Management Consultants.
INTRODUCTION

The construction industry is often known as a highly fragmented industry with a large number of activities involving different parties and professionals such as architects, engineers, quantity surveyors, contractor’s teams, suppliers, financiers and others. By being a fragmented industry, management efficiency and competency in the industry is needed to gain a higher level of competitiveness. The needs for such an approach has become more important and more pronounced, not only due to the increased size and complexity of building projects but also as a result of growing participation by international contractors.

One of the management solutions that have been widely used to improve efficiency of a project is through the use of Project Management Consultant (PMC) services. The use of its services has increased in every construction industry throughout the world.

The question is whether the services provided by PMC is adequate in ensuring that projects are completed according to the budget or cheaper, are of high quality and meet the client needs. Hence, this study was carried out to investigate the services that should be provided by Project Management Consultants (PMC) in the construction industry as well as to measure the level of services provided by Project Management Consultant (PMC) in the construction industry.

This study presents the scenario of applying project management consultant approach in construction industry recently by exploring the definition of the project and project management. This study also looks at the background of Project Management Consultant by defining the words ‘consultant’ in order to clarify the services offered by PMCs. The discussion also covers the role and responsibilities of PMC, the criteria of consultant selection, and the body of knowledge, required for the Project Management Consultant.

1.1 Objectives of the Study

The main objectives of the study are as follows

- To develop a framework of services that should be provided by Project Management Consultant (PMC)
- To identify different services provided by Project Management Consultant (PMC)

1.2 Scope of the Work

This study was carried out based on the case study and data collected from the Questionnaires. The work focuses on the private and government projects using Project Management Consultant (PMC) services. It looked into the types of services provided by Project Management Consultant (PMC) of the project. The study is limited to project management of construction and infrastructure projects in India undertaken by Project Management Consultant (PMC) in Maharashtra (Pune, Mumbai, Nagpur, Amravati and Sholapur), Delhi, Sikkim and Kolkata.

2 Literature Review

Project Management is increasingly becoming a very important discipline worldwide, in view of its importance in managing change and transition. Many construction firms have invested a lot of effort into training project managers to employ this approach. Some have achieved a more efficient way of completing projects; others have not been able to integrate project management into a project to a successful level. Some organizations had to use the capability of others who offer the Project Management Consultancy services in order to accomplish their goals and objectives.
2.1 Definition of Project

A “project” can be defined loosely as an item of work which requires planning, organizing and dedicating resources and expenditure funds, in order to produce a concept, or a plant (James and Albert, 1994). A project can be defined in terms of distinctive characteristics – a project is a temporary endeavor undertaken to create a unique product or services. Temporary means that every project has a definite beginning and ending. Unique means that the product or service in some distinguishing way from all similar products or services.

The project management institute (1996) defines a project as “a temporary endeavor to create a unique product or service”. (Michael Gerard Whelton, 2004)

Dhillon (2002) on the other hand, defines project as a plan of work job assignment or task (it is also referred to as job or task). Harold (2003), however defines project to be any series of activities and task that have a specific objective to be completed within certain specifications, have defined start and end dates, have funding limits, consume human resources, and are multifunctional.

2.2 Definition of Project Management

Project management is defined as the systematic application of management and construction expertise – through the planning, design, and construction processes – for the purpose of controlling the time, cost, and quality of design and construction. Although the success of the project is influence by variety of factors, in practically in all cases, successful project management will improve project quality while helping to maintain project budget and scope. (Kuprenas, et al, 1999)

Dhillon (2002) defines project management as the art of directing and coordinating material and human resources throughout the project life span by utilizing, by various management methods and techniques to archive effectively predetermined goals of scope, quality, time, cost and participant satisfaction. Harold (2003) states that project management is that project management is the planning, organizing, directing and controlling of company resources for a relatively shortterm objective that has been established to complete specific goals and objectives. Furthermore, project management utilizes the system approach to management in having functional personal (the vertical hierarchy) assigned to a specific project (the horizontal hierarchy).

With the various definition of project management available, the definition used for the purpose of this study is defined by Walker (2002) “Project management as the planning, coordination and control of a project from conception to completion (including commissioning) on behalf of a client requiring the identification of clients objectives in terms of utility, function, quality, time and cost and the establishment of relationship between resources, integrating, monitoring and controlling the contributors to the projects and output, and evaluating and selecting alternatives in pursuit of the client’s satisfaction with the project outcome”.

2.3 Project Management Consultant (PMC)

There is no specific definition of project management consultant (PMC). Most definition described management consultant by their roles and responsibility and services that they provide using tools and skills they have in delivering a task assigned by the client or the owner of the project. Ernest (1988) stated that the management consultant often serves in several ways; many of which assist in keeping the project confidential until time for public release. The management consultant also provides an outside, imperial sources of information and appraisal of the entire project feasibility. (D.B.Ismail, 2005)

Consultation occurs when a client seeks the expert knowledge and the experience of a consulting engineer. The client needs opinions on some engineering problem or on some procedure, program, or project that involves engineering matters. Consultations may be brief or extended. Some involves only a few hours of time, with the client sitting across the desk from the consultant. Other consultations may require considerable traveling, a substantial portion of a consultant’s time over a period of several months, and repeated presentations and discussions with the client (Maxwell, 1982). This definition was agreed by Keri and Patricia (1989), where they describe a consultant as someone who is in a position to influence change but who has no direct authority to implement changes. A client is any person or group whom the consultant seeks to influence. (Whelton Michael Gerard, 2004)

2.4 Roles and Responsibility of Project Management Consultant

To understand the roles & responsibilities of Project Management Consultant one must know the liabilities attached to standard of care expected from Project Management Consultant. If there are no liabilities associated with what Consultants do, then there is no sense of responsibility, role, duty of care or even moral obligations. (Ir. Dr.Abdul Majid, 2009)

Levy (2000) then added that management of construction projects can be divided into four major components, which are

2.4.1 Construction Engineering.

The proper technique of assembling materials, components, equipment, and systems, and the selection and utilization of the best construction technology in doing so.
2.4.2 Management of the Construction Process.
Establishing the best way to implement the construction process, this would include proper scheduling and the coordination and control of the flow of labor, materials, and equipment to the job site.

2.4.3 Human Resources Management.
Since labor productivity and a harmonious working environment are essential elements of a successful project, control over human resources becomes important, more so than ever in these days of shortages of both workers and managers.

2.4.4 Financial Management.
Construction is a business and must be viewed as such. Control over cost, cash flow and adequate project funding are essential part of any business endeavor and construction is no exception. Due to its comprehensiveness and clarity, this term is used for the propose of this study. In order to achieve such goals, Project Management Consultant (PMC) must be staffed by multi-disciplined professionals who have all the required knowledge in order to discharge their duties effectively and efficiently.

2.5 Body of Knowledge required for Project Management Consultant
It is important for the Project Management Consultant (PMC) to develop the body of knowledge before they provide the PMC services to clients. The firms that offer the consultant management services should have the required knowledge in order to tackle any problem that occurs and to ensure that the projects can be delivered successfully. One of the important key areas is they will need to develop the knowledge to use local materials and construction techniques in such a way as to minimize costs and take full advantage of local existing facilities. He should be noted that successful global companies will have to be very good in basic project management processes of planning, designing, scheduling, controlling costs, and managing materials and construction. The main areas of knowledge to be covered by a project management consultant’s firm are illustrated in Figure 2.1 taken from Bernard (1985).

![Figure 2.1: Body of Knowledge for Project Management Consultant](image)

3 Methodology
The methodological procedure is to ensure that the information collected for this study is rigorously obtained, relevant and capable of scientific evaluation. The methodology for this study consists of four steps as follows

3.1 Literature Review
3.2 Case Study
3.3 Questionnaire Survey
3.4 Data Analysis

3.1 Literature Review
Literature review was undertaken to obtain the general view of the investigation carried out by the author that are relevant to the study as well as to help the author to meet the objectives highlighted. Therefore, the objective of this work will be achieved through undertaking a comprehensive literature search to adequately define

3.1.1. Project Management Consultant (PMC)
3.1.2 Services provided by Project Management Consultant (PMC)

3.2 Case Study
The case studies were carried out to meet the first objective of this investigation which was to identify the services that should be provided by Project Management Consultant (PMC). Six projects undertaken by both private and government firm were selected to achieve this objective. Out of these six projects, four projects selected randomly for the further investigation due to its privacy, confidentiality and strict rules policies.

Two phases of industry survey were conducted. The first phase was a review of actual example of the contract between client and PMC. Some of the information collected was obtained...
through the interviewing process with the necessary person in charged in order to access the documents with some strictly confidential data. The second phase of the industry survey involved a series of interview with experienced project management consultant, clients, project engineers, project managers, architects of respective construction firms. Some data was also obtained from the questionnaire distributed to parties involving Project Management Consultant, clients, contractors, and developers.

3.3 Questionnaire Survey
An industry survey was carried out by the author and distributed to the parties who liaised with the Project Management Consultant services respectively. The questionnaire prepared by author as referred by D.B. Ismail, 2005. Some adjustments and correction were made based on the comments received from respondents during site visit and distribution. The questionnaire survey was divided into two major sections (A and B), Section A Demographics (General information of the respondents and the organization) and Section B Services provided by Project management Consultant.

A total of 150 questionnaires were then distributed to the potential respondents in Maharashtra (which included Mumbai, Pune, Nagpur, Amravati and Solapur), Kolkata, Delhi and Sikkim. Out of 150 questionnaires, only 67 questionnaires were returned which represent 44.67 percent of the total questionnaire distributed, out of which 56 were selected for further analysis. The parties who respond to the questionnaires includes the clients, contractors, architects, project engineers, project managers, project executives and the Project Management Consultants.

3.4 Data Analysis
All the collected data from the questionnaires were analyzed in two steps or methods. These are Frequency Analysis and Average Index. Frequency analysis is used as preliminary analysis. This method will show the frequency and the percentage. The frequencies are represented in the form of tables and pie charts. In analyzing the data, the following assumed values have been considered for responses on the degree of importance of services that should be provided by Project Management Consultant (PMC) as referred by D. B. Ismail.

- Very important 1
- Important 2
- Moderately Important 3
- Less important 4
- Not important 5

3.4.1 Average Index
The data collected on the degree of importance of services provided by the Project Management Consultant (PMC) were tabulated based on the number of responses for each category of degree of importance. Based on the frequency analyses the average index was then calculated to determine the ranking of each constructability principles being considered. The average index is calculated as follows:

\[ \text{Average Index} = \frac{\sum a_i x_i}{\sum x_i} \]

Where,

- \( a_i \) = constant expressing the weight given to \( x_i \) where \( i = 1, 2, 3, 4, 5 \)
- \( x_i \) = variable expressing the frequency of response according to \( a \).

Based on the assumed values stated earlier,

- \( x_1 \) = frequency of the “very important” and corresponding to \( a_1 = 1 \),
- \( x_2 \) = frequency of the “important” and corresponding to \( a_2 = 2 \),
- \( x_3 \) = frequency of the “moderately important” and corresponding to \( a_3 = 3 \),
- \( x_4 \) = frequency of the “Less important” and corresponding to \( a_4 = 4 \),
- \( x_5 \) = frequency of the “Not important” and corresponding to \( a_5 = 5 \).

In order to determine the degree of importance of the services provided by the Project management Consultant in this study the classification of the rating scale proposed by D. B. Ismail (2005) have been used. The classification of the rating scales are as follows

- “Very important” 1.00 < Average Index < 1.50
- “Important” 1.50 ≤ Average Index < 2.50
- “Moderately important” 2.50 ≤ Average Index < 3.50
- “Less important” 3.50 ≤ Average Index ≤ 4.50
- “Not important” 4.50 ≤ Average Index ≤ 5.00

4. Analysis and Results
The combination of four consultant contracting organization will develop the actual services which need to be carried out by the PMC in practice. The author had combined the description of services of the four contracts and had developed a framework of services which is listed as one of the objectives in this study.

From the framework, the author had conduct an industry survey using the questionnaires to measure the level of importance of each service listed in the case study. Table 4.1 below shows the framework of services that should be provided by the Project Management Consultant in construction industry.

The results and analysis from the questionnaire (section A and section B) illustrates in 4.1 as demographics and 4.2 as services provided by PMC.
4.1 SECTION A: Demographics

Demographics include information of respondents, position and organization.

4.1.1 Which organization do you represent?

The respondents were asked to identify, from the list given, the organization that the respondents represents in order for the author to classify the type of respondents. The results for question 1, shown in table 4.2.

Table 4.2 shows the profile of the respondents of the preliminary survey where majority (53.57%) of the respondents were from Contractor/developer firm. From the total number of respondents, project Management Consultant Firms represent 8.93%, the consultant firm represents 21.43%, while only 8.93% and 7.15% were from government firm and other firms respectively.

4.1.2 Position in the organization

The respondents were asked to identify, from the list given, the position that the respondents holds in the organization that the respondents represents. Table 4.3 shows the types of respondents against their position in the company. It was found that 16.07 percent of the respondents who hold project manager position work with contractor/developer (7), Project management Consultant (1) and Consultant Firms (1) which contribute to the total numbers of 9 out of 56 respondents. The number of project engineer involved in this questionnaire survey will provide a good result in terms of their knowledge and experience which can contribute to this investigation. Eight respondents work as project engineer in Contractor/developer, Three in Consultant Firm, 4 in government and 2 in PMC Firm. The respondents who hold the position of Architect and Client’s scored the same percentage of (5.35%) which contributes to the total number of 56 respondents.

<table>
<thead>
<tr>
<th>Types of Respondent</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>5</td>
<td>8.92</td>
</tr>
<tr>
<td>Contractors/Developers</td>
<td>30</td>
<td>53.57</td>
</tr>
<tr>
<td>Consultant firm</td>
<td>12</td>
<td>21.43</td>
</tr>
<tr>
<td>Project Management Consultant (PMC) firms</td>
<td>5</td>
<td>8.93</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>7.15</td>
</tr>
<tr>
<td>Total (N=56)</td>
<td>56</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.2: Types of Respondent
4.1.3 How many construction project have you been involved in before?

The respondents were asked to identify, from the list given, the number of construction projects that the respondents have been involved in before. Table 4.4 shows the respondents’ position in the organization and number of construction projects that the respondents have been involved in previously.

From table 4.4 above, most of the respondents have been involved in 1 – 5 construction projects in which the respondents were project managers (6), Project engineers (10), Architect (2), Clients representative (1) and others (16). These contribute to 35 out of 56 total respondents (62.5%). A total of (10.72%) of respondents had experienced more than 10 construction projects. The rest (26.78%) of the respondents have been involved in between 5 – 10 construction projects. This shows that most of the respondents had multiple experiences in the construction industry with numbers of projects.

4.1.4 How many projects you have been involved in used the services of PMC?

The respondents were asked to identify, from the list given, the number of projects that the respondents had carried out that employed the services of PMC. Table 4.5 shows the types of respondents against the number of projects that used the services of PMC.

Table 4.5 shows that 89.28 percent of the respondents had used the services of PMC for 15 projects. The main contributor for this high percentage is from the respondents who work with the Consultant Firms (30). The study also found that 8.93 percent of the respondents used the services of PMC for 5 – 10 projects. Only 1.79 percent of the respondents had used the services of PMC for 10 or more of their projects. The results show that most of the projects carried out by the respondents had used other methods of handling the projects i.e. traditional approaches where it did not require any project management services.

4.1.5 What is the type of PMC’s project that your company often deals with?

The respondents were asked to identify, from the list given, the types of Project Management Consultant project that their company often deals with. The results for question 5, in table 4.6 show the types of respondents against the number of projects that used the services of PMC.

The study found, as shown in the table 4.6, that most of the respondents had dealt with private projects which used the services of PMC. It represented 53.58 percent of the total result. From the table, it can be noted that only three government servants had been involved in the government type of PMC engage-
Table 4.6: Types of respondent and types of PMC project

<table>
<thead>
<tr>
<th>Types of Respondent</th>
<th>Types of PMC Projects</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>Government</td>
<td>Both</td>
</tr>
<tr>
<td>Government</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Contractors/Developers</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Consultant firm</td>
<td>22</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Project Management Consultant (PMC) firm</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total (N=56)</td>
<td>30</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>53.58</td>
<td>12.5</td>
<td>33.92</td>
</tr>
</tbody>
</table>

Table 4.7 shows the profile of degree of importance of services that should be provided by Project Management Consultant (PMC).

4.2 SECTION B: Services Provided by PMC

The respondents were asked to rate the degree of importance on the list of services provided by the PMC as per the questionnaire (Section – B) as reported by D. B. Ismail, 2005. In analyzing the data, the following assumed values have been considered for responses on the degree of importance of services that should be provided by Project Management Consultant (PMC): “Very important” (1), “Important” (2), “Moderately Important” (3), “Less important” (4), and “Not important” (5). The list provided was produced by the author from the case study carried out and was arranged and classified according to the objective of study.

The results of the survey for the level of importance on the list of services that should be provided by Project management Consultant (PMC) show that most of the services were regarded by the respondents as important services and should be carried out by the Project management Consultant (PMC).

Out of 56 respondents, 53.58 percent declared that they had involved private project management contract while 33.92 percent confirmed that they had liaised with both government and private project management contracts.

This result showed that the government projects in the construction industry had also applied the project management approach to execute projects.
Table 5.1: Level of degree of importance of PMC services as per average index rating scale and respondents views

<table>
<thead>
<tr>
<th>Services Provided by PMC</th>
<th>1</th>
<th>%</th>
<th>2</th>
<th>%</th>
<th>3</th>
<th>%</th>
<th>4</th>
<th>%</th>
<th>5</th>
<th>%</th>
<th>Average Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clients Requirements</td>
<td>39</td>
<td>69.64</td>
<td>15</td>
<td>26.78</td>
<td>3</td>
<td>5.35</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.36</td>
</tr>
<tr>
<td>Quality Control</td>
<td>35</td>
<td>62.5</td>
<td>17</td>
<td>30.35</td>
<td>3</td>
<td>5.35</td>
<td>1</td>
<td>1.78</td>
<td>0</td>
<td>0</td>
<td>1.46</td>
</tr>
<tr>
<td>Meeting</td>
<td>15</td>
<td>26.78</td>
<td>27</td>
<td>48.21</td>
<td>15</td>
<td>26.78</td>
<td>2</td>
<td>3.57</td>
<td>0</td>
<td>0</td>
<td>1.61</td>
</tr>
<tr>
<td>Scheduling</td>
<td>26</td>
<td>46.42</td>
<td>23</td>
<td>41.07</td>
<td>6</td>
<td>10.71</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.63</td>
</tr>
<tr>
<td>Design Management</td>
<td>30</td>
<td>53.57</td>
<td>19</td>
<td>33.92</td>
<td>6</td>
<td>10.71</td>
<td>1</td>
<td>1.78</td>
<td>1</td>
<td>1.78</td>
<td>1.66</td>
</tr>
<tr>
<td>Cost Control</td>
<td>29</td>
<td>51.78</td>
<td>21</td>
<td>37.5</td>
<td>4</td>
<td>7.14</td>
<td>2</td>
<td>3.57</td>
<td>1</td>
<td>1.78</td>
<td>1.68</td>
</tr>
<tr>
<td>Contract and legal</td>
<td>26</td>
<td>46.42</td>
<td>25</td>
<td>44.62</td>
<td>2</td>
<td>3.57</td>
<td>1</td>
<td>1.78</td>
<td>2</td>
<td>3.57</td>
<td>1.71</td>
</tr>
<tr>
<td>Management of Construction</td>
<td>20</td>
<td>35.71</td>
<td>27</td>
<td>48.21</td>
<td>9</td>
<td>16.07</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.80</td>
</tr>
<tr>
<td>Commissioning</td>
<td>18</td>
<td>32.14</td>
<td>29</td>
<td>51.78</td>
<td>8</td>
<td>14.28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.81</td>
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<tr>
<td>Management of consultant</td>
<td>18</td>
<td>32.14</td>
<td>24</td>
<td>42.85</td>
<td>11</td>
<td>19.64</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.86</td>
</tr>
<tr>
<td>Estimation &amp; costing</td>
<td>23</td>
<td>41.07</td>
<td>22</td>
<td>39.28</td>
<td>8</td>
<td>14.28</td>
<td>1</td>
<td>1.78</td>
<td>2</td>
<td>3.57</td>
<td>1.87</td>
</tr>
<tr>
<td>Feasibility study</td>
<td>22</td>
<td>39.28</td>
<td>20</td>
<td>35.71</td>
<td>11</td>
<td>19.64</td>
<td>1</td>
<td>1.78</td>
<td>1</td>
<td>1.78</td>
<td>1.89</td>
</tr>
<tr>
<td>Preliminary Requirements</td>
<td>19</td>
<td>33.92</td>
<td>25</td>
<td>44.62</td>
<td>12</td>
<td>21.42</td>
<td>2</td>
<td>3.57</td>
<td>0</td>
<td>0</td>
<td>1.94</td>
</tr>
<tr>
<td>Procurement</td>
<td>13</td>
<td>23.21</td>
<td>19</td>
<td>33.92</td>
<td>19</td>
<td>33.92</td>
<td>3</td>
<td>5.35</td>
<td>3</td>
<td>5.35</td>
<td>2.03</td>
</tr>
<tr>
<td>Reporting</td>
<td>16</td>
<td>28.57</td>
<td>25</td>
<td>44.62</td>
<td>11</td>
<td>19.64</td>
<td>3</td>
<td>5.35</td>
<td>0</td>
<td>0</td>
<td>2.09</td>
</tr>
<tr>
<td>Payment Certification</td>
<td>14</td>
<td>25</td>
<td>23</td>
<td>41.07</td>
<td>13</td>
<td>23.21</td>
<td>4</td>
<td>7.14</td>
<td>2</td>
<td>3.57</td>
<td>2.23</td>
</tr>
</tbody>
</table>

Consultant (PMC), which shows only two services were considered by the respondents as very important which are client’s requirement and quality control with average index 1.36 and 1.46.

The overall results are tabulated in figure 4.1 as per the degree of importance and average index.

5. Conclusions

From the study, it is concluded that PMC is a very important entity in construction industry and PMC services is one of the widely used method implemented in the construction firm.

From the case study carried out, the author had combined the description of services of the four contracts and had developed a Framework which consists of 16 lists of services that need to be carried out by PMC.
From the results of the survey analysis, for the degree of importance of services that should be provided by Project Management Consultant (PMC) it can be concluded that, most of the services listed by the author were approved by the respondents as “important” services and should be carried out by the PMC. Only two services were regarded by the respondents as “very important” which are client requirements and quality control with average Index 1.36 and 1.46 respectively and other services regarded as “important”.

The level of degree of importance of services that should be provided by PMC, whether it is importance or very important depends on average index values and respondents views, shown in table 5.1.

As per the respondents view, site visit and case studies carried out by author, Project Management Consultant first identify the client requirements and ensures to give qualitative output.

6. References
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